

Annex 1: Production and Productivity Trends According to Available Statistics

1. Introduction

This annex presents global statistical data in an attempt to establish to what extent and in which areas development and structural changes have taken place in the agricultural sector of Botswana. It uses readily available statistical sources about value added, production and productivity.

The annex looks for trends which may be related to agricultural expenditure. Obviously, the link between production levels and growth and public expenditure is not straight-forward. Many other factors determine production and growth – climatic conditions, labor availability and markets are the most important ones. Furthermore, a substantial part of expenditure is required just to maintain production levels and provide the inputs with public goods characteristics required in the production process. However, part of expenditure was also geared towards creating growth and improvements in productivity. If growth has not taken place and productivity not improved, the success of public policy and spending needs to be questioned.

Data availability at this level is quite good. The concepts used to collect and present the data have been stable over many years, the results allow consistent comparisons over long periods. Two main sources, both from Statistics Botswana, are used:

- Reports on the results of agricultural surveys and censuses; they are based on annual post-harvest surveys for the traditional sector and on questionnaires for the commercial sector; and
- GDP statistics, which are based on separate questionnaires sent to commercial holdings, while relying on the results of the agricultural surveys for the traditional sector.

The agricultural surveys are very detailed and collect and present production and productivity as well as demographic data. The series has gaps – there are years in which the survey has either not taken place or the results were not published. But the missing years are only occasional and do not represent a serious constraint for the type of analysis required.

GDP statistics relate to the value-added of the agricultural sector, equivalent to the sector's contribution to GDP. Data are available in constant and current prices. The sector is subdivided into crops, livestock and "other". "Crops" include grains, beans and other field crops like, for instance, sunflower. "Livestock" covers all agricultural activities based on farmed animals (i.e., not hunting) and includes cattle, sheep, goats and also game farming and poultry. GDP data on livestock also cover industrial scale production of eggs and chicken meat. The category "Other" includes horticultural products, fruit production, honey, and (very small) hunting, fishing and forestry.

GDP data series are available in current and in constant 2006 prices. Series in constant prices remove the element of inflation and indicate quantitative changes in principle. However, due to the mechanics of data collection and calculation, changes in the value-added element of a sector's sales may not always be captured.

Agricultural surveys relate to the agricultural season which ended in the year indicated. GDP statistics relate to the calendar year and reflect, in the case of arable agriculture, the results of the agricultural season from year n-1 to year n, with "n" being the year shown on the title page of the publication.

It should be noted that GDP statistics are designed to provide a broad picture about economic growth and a broad indication of its drivers at the national level. Data are collected by subsector (or sub-industries, as called in this context), but the breakdown of “agriculture” into its components is not generally published; we obtained the data upon specific request from the responsible department of Statistics Botswana. For the broad picture, details do not matter so much because errors tend to cancel out when components are aggregated. Interpreting subsector data in the way presented below might sometimes be overstretching the interpretability of the data.

Both GDP and Survey series include production for subsistence agriculture.

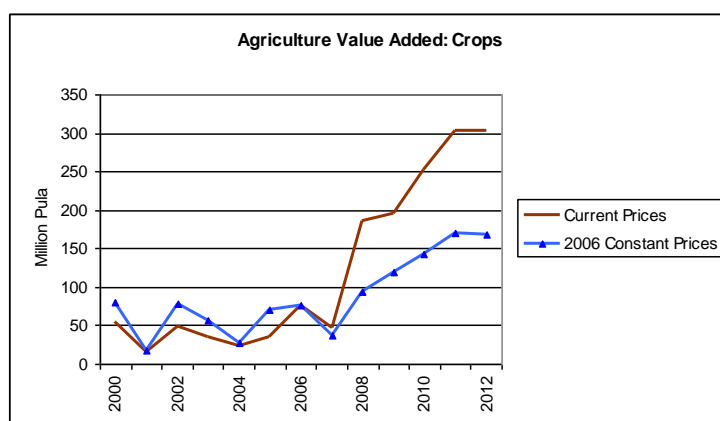
In the following, the data and interpretations are presented by subsector.

2. Crop subsector

2.1 Crops: GDP

Value-added derived from crops remained basically stagnant until the year 2007, both in current and in constant prices. From 2008 onwards, value-added increased steadily in both constant prices, and much faster in current prices (Figure 1). The value-added in current prices increased fourfold between 2006 and 2012; in constant prices, it increased by 120 percent.¹

Figure 1: GDP Contribution of Crop Subsector



Source of data: Statistics Botswana, GDP by Sub-industries. File obtained in February 2014.

¹ The year 2006 was based as a reference because 2007 figures are atypically low.

Table 1: GDP Contribution (Value-Added) of Agricultural Subsectors, Current and Constant Prices

Million Pula								
Year	Crops		Livestock		Other		Total Agriculture	
	Current Prices	Constant Prices	Current Prices	Constant Prices	Current Prices	Constant Prices	Current Prices	Constant Prices
2000	55	80	582	661	183	315	825	1,063
2001	17	18	578	783	232	339	831	1,142
2002	50	77	565	547	215	282	835	908
2003	35	56	693	704	276	329	1,012	1,091
2004	23	28	646	778	281	295	950	1,096
2005	35	71	596	712	307	310	928	1,068
2006	76	76	771	771	388	388	1,211	1,206
2007	46	38	1,002	862	489	486	1,505	1,359
2008	186	95	1,188	799	524	494	1,887	1,386
2009	196	118	1,194	760	676	598	2,071	1,474
2010	251	142	1,773	998	679	565	2,717	1,720
2011	303	171	1,607	574	711	566	2,636	1,326
2012	303	169	1,912	684	733	593	2,963	1,461
Averages								
2000-2007	42	56	679	727	296	343	1,012	1,117
2008-2012	248	139	1,535	763	665	563	2,455	1,474

Source of data: Statistics Botswana: GDP by Sub-industries. File obtained in February 2014.

Note: The sum of the columns on crops, livestock and other does not usually equal the value shown for "Total Agriculture" at the right side of the table. This is because imputed financial services are added/subtracted from the total, but not at sub-industry level.

Growth from 2008 onwards looks impressive, but there are some doubts over the significance, as growth is not reflected in quantitative crop statistics. The data on value-added and contribution do GDP may actually reflect primarily the input subsidies which the ISPAAD program has provided to crop farmers. ISPAAD funds started to flow on a larger scale in Fiscal Year and agricultural season 2008/09.²

ISPAAD spending amounted to about P200 million per year. The increase in the nominal value-added of crops from P76 million in 2006 to P303 million in 2012, an increase of P227 million, is higher, but only by a modest margin.

2.2 Crops: Agricultural Surveys

Results from the annual agricultural surveys confirm doubts about whether increased value-added does actually indicate real growth.

Maize production statistics show significant volatility and no clear trend. Production, which includes subsistence production, has been stagnant at about 10,000 tons per year, with significant fluctuations. For reference: chicken producers alone import some 90,000 tons of maize per year for mixing into poultry feed.³

Note that in this graph, the underlying data relating to commercial production were reduced from what the original publication shows because of clear, although not immediately obvious errors in the

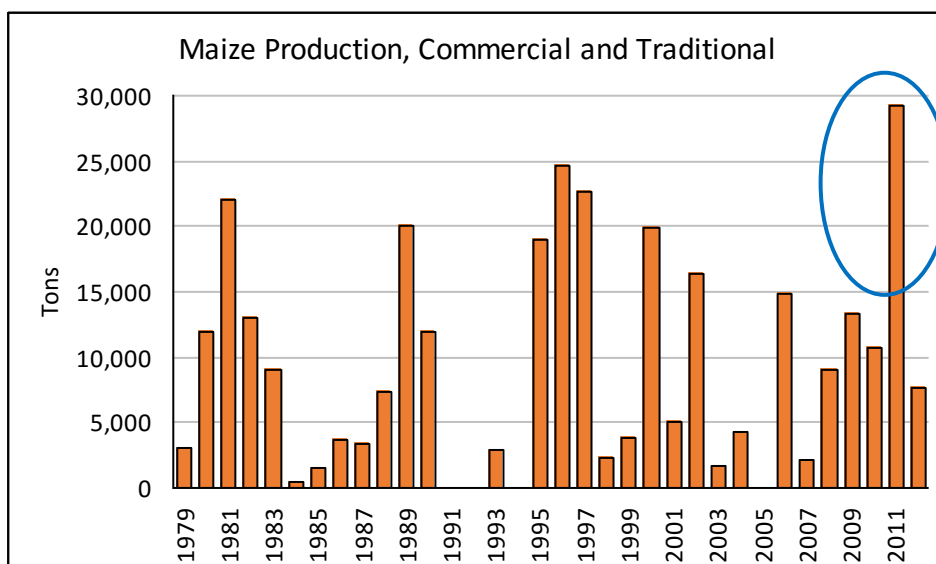
² Our Team could not ascertain whether the practice of compiling GDP data actually captures this effect. In practice, statistics bureaus assess output or sales data of a sector and then assume a factor to convert output to income. These conversion factors are only updated from time to time. Data for the commercial sector are collected via questionnaires, which farmers are expected to fill in according to their accounting data. Here, the effect of subsidies would be captured.

³ According to a statement from a representative of the poultry industry during a workshop in February 2014.

data on commercial maize production in the years 2009 and 2010. The numbers were adjusted to take this into account.

The peak in 2011 shown in the chart below is entirely due to traditional sector production. Disaggregated data per district were consistent with the aggregated results shown.

Figure 2: Maize Production, Commercial and Traditional



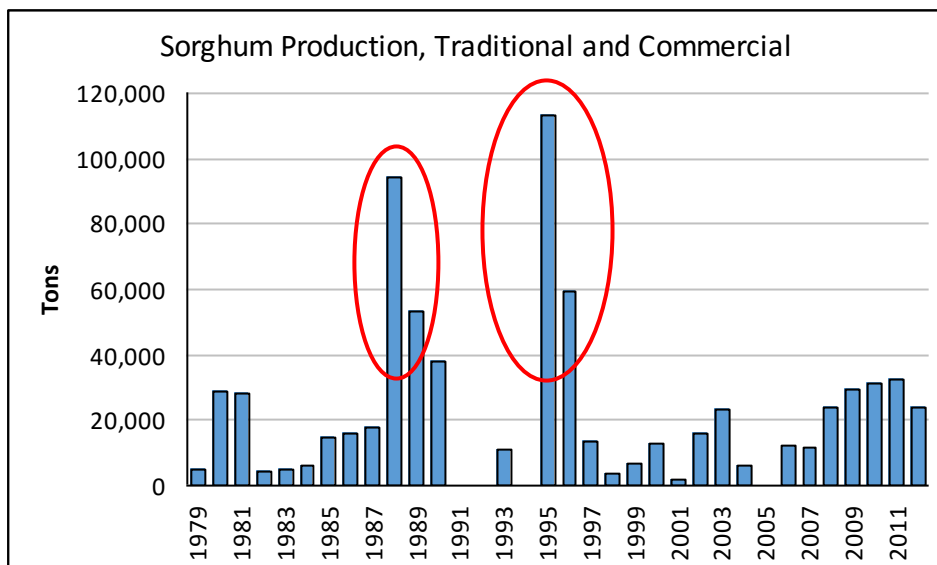
Source of data: Statistics Botswana: 2012 Annual Agricultural Survey Report. Gaborone, April 2014.

NOTE: Data on commercial maize for 2010 and 2009 were reduced from what the publications state because of errors detected in commercial maize production as reported in the Agricultural Survey Reports.

The production of **sorghum**, the other main agricultural crop in Botswana, stood at around 25,000 tons in the past years. However, statistics show exceptional variations across years.

The data for the years 1988-1990 and again for 1995-1996 are totally outside the series' trend, but appear to reflect particular situations. We were told that 1995 was an extremely good year because rainfall was good and seeds and other inputs available.

Figure 3: Sorghum Production, Traditional and Commercial

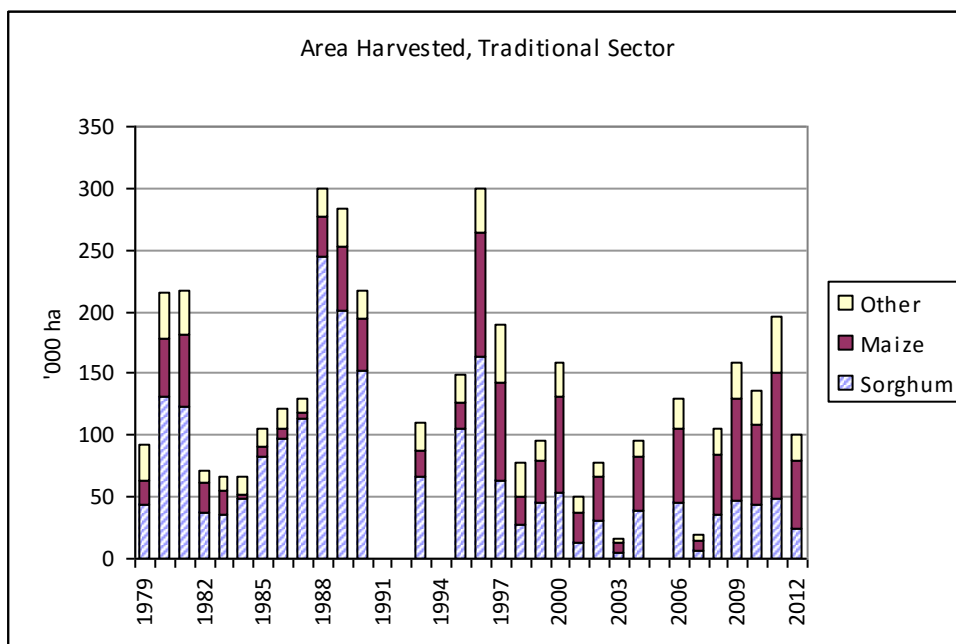


Source of data: Statistics Botswana: 2012 Annual Agricultural Survey Report. Gaborone, April 2014.

Data on area harvested are more consistent than production data (Figure 4). The area harvested for all crops combined in the traditional sector stands around 150,000 ha, again with drastic fluctuations across years. Data show pronounced peaks for the periods 1998-1990 and 1996) which are presumably due to good rainfall.

The last few years are interesting because they could show the effect of the agricultural support schemes in general and ISPAAD in particular. The area harvested has been consistently higher than in the beginning of the 2000's, with the exception of 2007. Fluctuations, mainly due to irregular rainfall, make it difficult to determine whether the increase represents a trend.

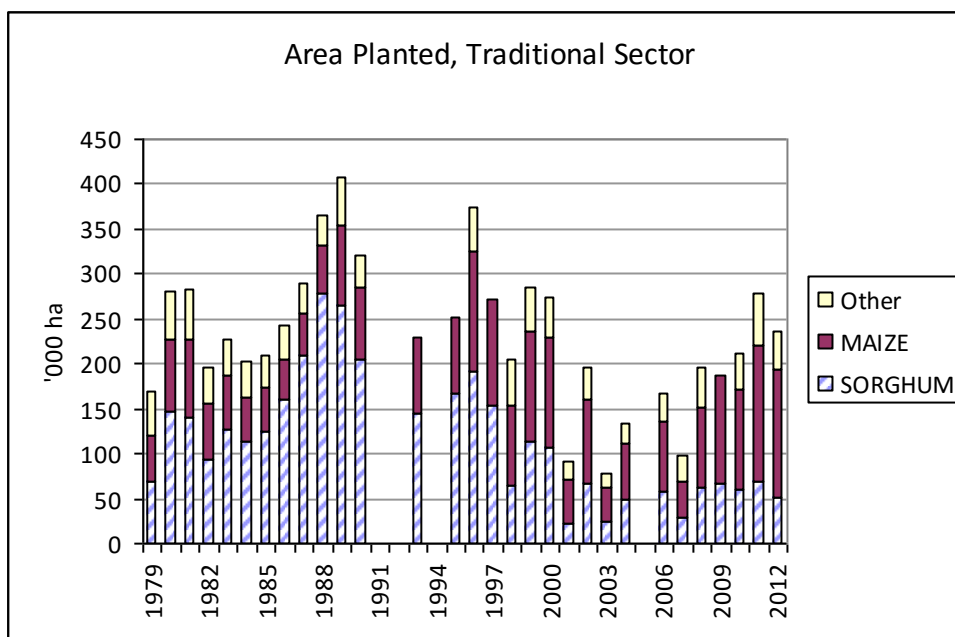
Figure 4: Area Harvested in the Traditional Sector, All Crops



Source of data: Statistics Botswana: 2012 Annual Agricultural Survey Report. Gaborone, April 2014.

Series on area planted reveal again the fluctuations, and evidence the absence of a clear trend (Figure 5). Area planted in the period 2006-12 is again higher than it was in the beginning of the decade, but lower than it was in 1980-90. At the same time, one can clearly see a shift from sorghum to maize. In interviews, this was explained by the fact that traditional farms are becoming increasingly short of labor. Unlike maize, sorghum is subject to birds harvesting the crop, and extensive time and effort are required for bird scaring in the weeks before harvesting. Therefore, traditional farmers opt to grow maize rather than sorghum.

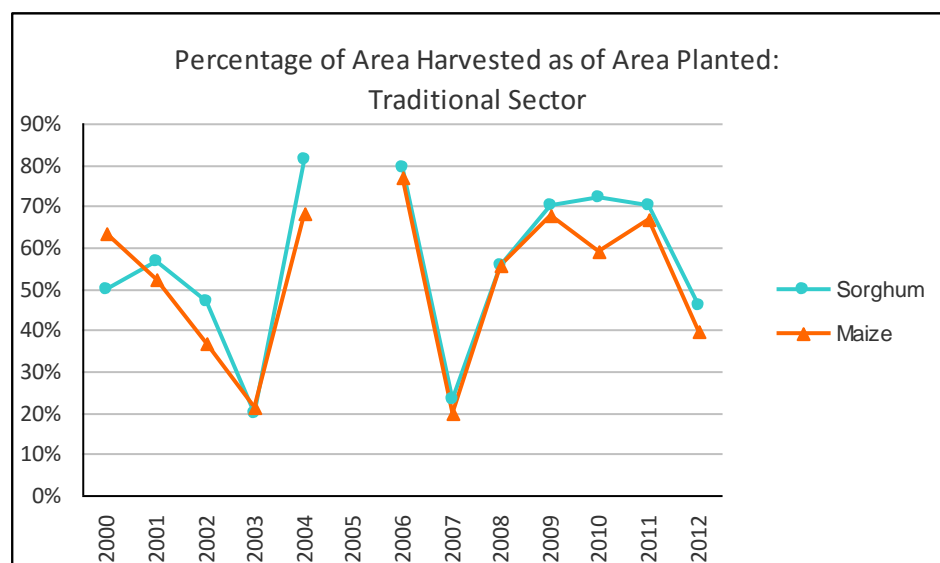
Figure 5: Area Planted in the Traditional Sector, All Crops



Source of data: Statistics Botswana: 2012 Annual Agricultural Survey Report. Gaborone, April 2014.

The share of area planted in the traditional sector that was actually harvested has been around 60 percent since 2008, but has fallen to 40-45 percent in 2012 (Figure 6). The average in recent years is higher than in the period 2000-2004, but climate related fluctuations may be disguising trends.

Note that the timing of rainfall determines areas planted and harvested in a different way. Some first rainfall is required before land can be prepared and crops planted. If the rains then fail, it is likely that only part of planted land is actually harvested. Thus, actual as well as expected rainfall determines both indicators.

Figure 6: Comparison Areas Planted and Harvested, Traditional Sector

Source of data: Statistics Botswana: 2012 Annual Agricultural Survey Report. Gaborone, April 2014.

Note: Data for 2005 are not available, as there was no survey report for that year.

Yields per area (measured in kg/ha) are assessed in relation to area planted and area harvested. Long series are only available for yields per area planted. Yields indicate efficiency of land use, but not necessarily of farming and farm labor. Increasing yields per hectare is the main focus of agricultural research and often also of agricultural policy. Yet, increasing areas rather than intensifying agriculture through the use of fertilizer and enhanced weeding on smaller plots may be an economically rational approach.

The more interesting indicator of yield per unit of labor is, unfortunately, not available, and would also be difficult to assess in practice.

Two different ways to assess yields per hectare are used: yields can be expressed as production per hectare planted or per hectare harvested.

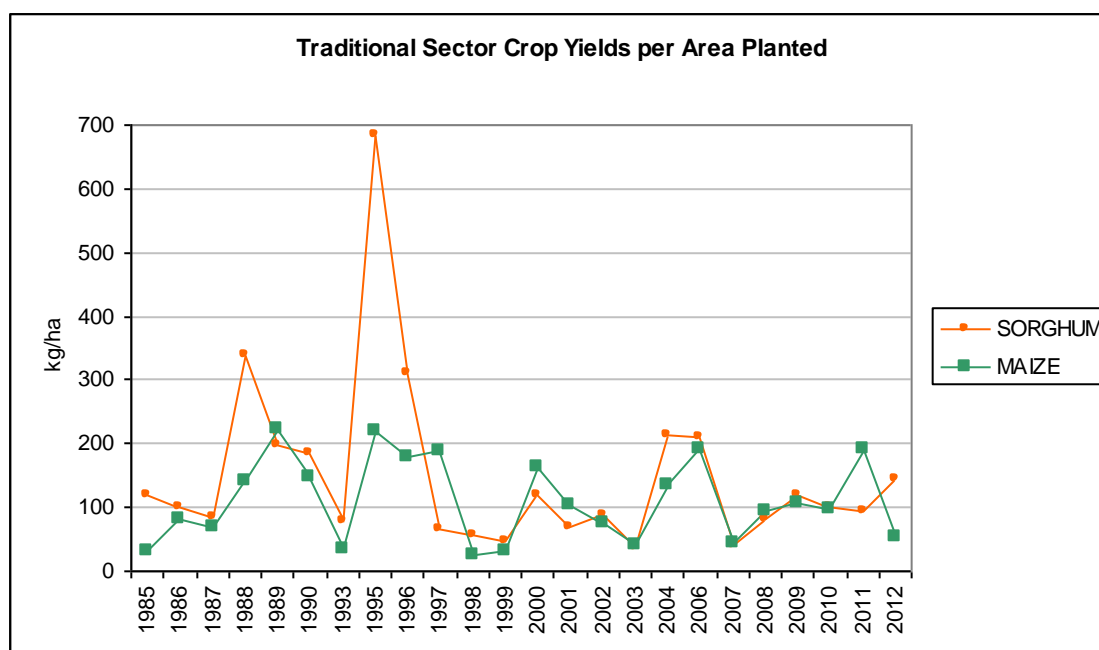
Yields per hectare for the main crops of the traditional sector continue to fluctuate. There is essentially no improvement compared to the first 10 years shown in the chart below (Figure 7). Yields per area planted fluctuate around 100 kg per hectare, which is very much below the yield obtained in research stations and way below the regional target (2000 kg/ha). Yields have not visibly improved after the introduction of ISPAAD in 2008.

The sorghum yields in 1988, 1995 and 1996 are reported at 300 kg per hectare or above. These years are exceptional due to favourable rainfall. Since the respective years were years with good rainfall, a low difference between areas planted and areas harvested may have played a role. Data on yield per area harvested are unfortunately not available as time series.

Although land productivity does not seem to have improved, labor productivity may have. Mechanization in traditional agriculture has increased during the past few years, and was promoted

by ISPAAD paying the full cost of land preparation for small farmers. Unfortunately, statistical series to support this hypothesis are not readily available.⁴

Figure 7: Crop Yields, Traditional Sector (Per Area Planted)



Source of data: Statistics Botswana: 2012 Annual Agricultural Survey Report. Gaborone, April 2014.

Crop yields per area planted and harvested are significantly higher in the commercial sector than they are in the traditional sector (Table 2). The difference is particularly high with respect to sorghum. However, one should be cautious with a general comparison because almost all sorghum and most maize is grown in the Pandamatenga area, which is characterized by very special conditions with regard to rainfall, fertility of soils and farm size, as well as the associated degree of mechanization and use of hybrid seeds, fertilizer and chemical means of pest control.

⁴ In order to construct such series, figures from each years' printed reports would need to be extracted; but even then, the labor input can only be estimated roughly for lack of detailed data about full and part-time labor on traditional farms.

Table 2: Crop Production and Yields, Traditional Versus Commercial Sector

	Traditional					Commercial					Total Production (tons)	
	Planted (ha)	Harvested (ha)	Production (tons)	Yield / planted (kg/ha)	Yield /harvested (kg/ha)	Planted (ha)	Harvested (ha)	Production (tons)	Yield / planted (kg/ha)	Yield /harvested (kg/ha)		
Maize												
1993	83,956	22,186	2,976	35	134	1,301	1,198	1,278	982	1,067	4,254	
2004	63,214	42,804	7,223	114	169	615	586	313	509	534	7,536	
2006	77,884	60,289	14,896	191	247	148	126	260	1,757	2,063	15,156	
2007	40,253	8,048	1,830	45	227	422	404	328	777	812	2,158	
2008	88,437	48,533	8,416	95	173	176	130	553	3,142	4,254	8,969	
2009	120,727	82,461	13,040	108	158	281	249	230	819	924	13,270 *	
2010	109,792	65,184	10,540	96	162	324	239	239	738	1,000	10,779 *	
2011	151,164	101,107	29,070	192	288	325	318	165	508	519	29,235 *	
2012	140,937	55,735	7,450	53	134	385	316	227	590	718	7,677	
Average 2004-12	99,051	58,020	11,558	112	195	335	296	289	1,105	1,353	11,848	
Sorghum												
1993	138,394	66,562	10,797	78	162	5,924	5,821	5,730	967	984	16,527	
2004	44,454	38,736	10,581	238	273	11,835	11,832	1,175	99	99	11,756	
2006	58,484	46,426	12,369	211	266	5,833	5,790	29,124	4,993	5,030	41,493	
2007	29,976	7,092	1,255	42	177	3,139	2,935	10,519	3,351	3,584	11,774	
2008	63,225	35,410	5,211	82	147	9,931	7,504	18,421	1,855	2,455	23,632	
2009	67,015	46,977	7,904	118	168	11,686	11,684	21,475	1,838	1,838	29,379	
2010	61,089	44,233	6,181	101	140	15,525	14,521	25,145	1,620	1,732	31,326	
2011	63,720	42,660	5,946	93	139	6,489	6,059	26,645	4,106	4,398	32,591	
2012	51,795	24,231	7,461	144	308	11,223	11,203	16,560	1,476	1,478	24,021	
Average 2004-12	54,970	35,721	7,114	129	202	9,458	8,941	18,633	2,417	2,577	25,747	
	* Numbers estimated; original figures contained clear errors in one commercial block.											

Source of data: Statistics Botswana: Annual Agricultural Survey Reports, Table 2.3, various years.

Yields in the traditional sector differ across districts (Table 3). But at district level, fluctuations across years continue to be very substantial.

Table 3: Traditional Crop Yields by District: Average of Five Years between 2006 and 2012

District / Region	Maize		Sorghum	
	kg/ha planted	kg/ha harvested	kg/ha planted	kg/ha harvested
Barolong	240	306	114	225
Ngwaketse South	269	352	329	422
Ngwaketse North	117	154	217	534
Ngwaketse Central	220	264	171	290
Ngwaketse West	88	114	89	145
SOUTHERN REGION	217	275	295	416
Bamalete/Tlokweneng	126	230	238	317
Kweneng South	76	139	58	110
Kweneng North	116	176	62	109
Kweneng West	103	151	63	109
Kgatleng	83	130	59	145
GABORONE REGION	99	156	66	123
Mahalapye East	57	120	85	120
Mahalapye West	77	131	90	134
Palapye	51	106	114	149
Serowe	108	179	147	217
Bobonong	74	133	88	124
Letlhakane	121	217	55	99
Selebi-Phikwe	42	93	82	130
CENTRAL REGION	72	137	106	148
Tati	74	138	113	180
Tutume	101	172	186	243
Tonota	97	156	143	188
FRANCISTOWN REGION	97	166	155	214
Ngamiland West	75	125	157	223
Ngamiland East	101	180	127	320
Chobe	192	398	369	620
MAUN REGION	95	167	192	305
Gantsi	91	144	18	45
Hukuntsi	36	71	56	59
Tsabong	277	420	33	78
WESTERN REGION	117	182	17	30
TOTAL TRADITIONAL	128	200	130	206

Source of data: Statistics Botswana: Agricultural Survey Reports, various years.

Note:

The 5 years are 2006, 2007, 2009, 2011 and 2012. No detailed data are available for the years not covered.

Mainly for reference, Table 4 below provides areas planted and harvested by traditional and commercial farmers in numeric format. The data show the small weight of commercial farming on the basis of area planted and harvested. Noteworthy are the variability of area planted by commercial farmers and also the totally unclear effect of ISPAAD (in operation since the 2008/09 season) on the area harvested by traditional farmers. .

Table 4: Area Planted and Harvested, Traditional and Commercial Farmers

	Area planted			Area harvested			hectares
	Traditional	Commercial	Total	Traditional	Commercial	Total	
2003	79,810	16,235	96,045	17,215	16,198	33,413	
2004	140,250	16,856	157,106	98,442	16,207	114,649	
2006	173,409	9,067	182,476	133,039	8,744	141,783	
2007	102,285	5,967	108,252	21,322	5,580	26,902	
2008	203,714	22,807	226,521	108,515	17,288	125,803	
2009	242,663	15,998	258,661	242,663	15,998	258,661	
2010	219,443	19,937	239,380	141,245	19,151	160,396	
2011	261,967	27,311	289,278	173,955	26,717	200,672	
2012	243,764	18,997	262,761	102,659	18,719	121,378	

Source of Data: Statistics Botswana: Agricultural Survey Reports, various years, Table 2.3.1.

Note: Areas refer to all agriculture and include those used to grow oil seeds, beans or fodder. The figures are slightly higher than those underlying Figure 5.

3. Livestock

3.1 Livestock: GDP

The livestock subsector's real contribution to GDP has essentially not increased over the period 2000-2012. However, puzzles and mysteries remain that our Team could not clarify. First, it is unclear why real value-added should have dropped in 2011 and 2012, since statistics do not show a steep reduction of herd sizes for these years. Second, the distance between series in real and in current prices suddenly increased substantially in 2011 and even more in 2012. Either a substantial increase in cattle prices or a much higher incidence of subsidies could explain this. However, no such price or subsidy increases could be found in these years.⁵

Statistics Botswana, responding to the question, gave the following explanation: "In 2011, animal population was declining. During this year there was drought and outbreak of foot and mouth disease in the northern side of Botswana which resulted in culling of affected animals. Drought killed a lot of traditional farming livestock. This resulted in the lower value added experienced in 2011."⁶ This, however, is not reflected in agricultural statistics about stocks and does not explain the much lesser drop in GDP in current than in constant prices.

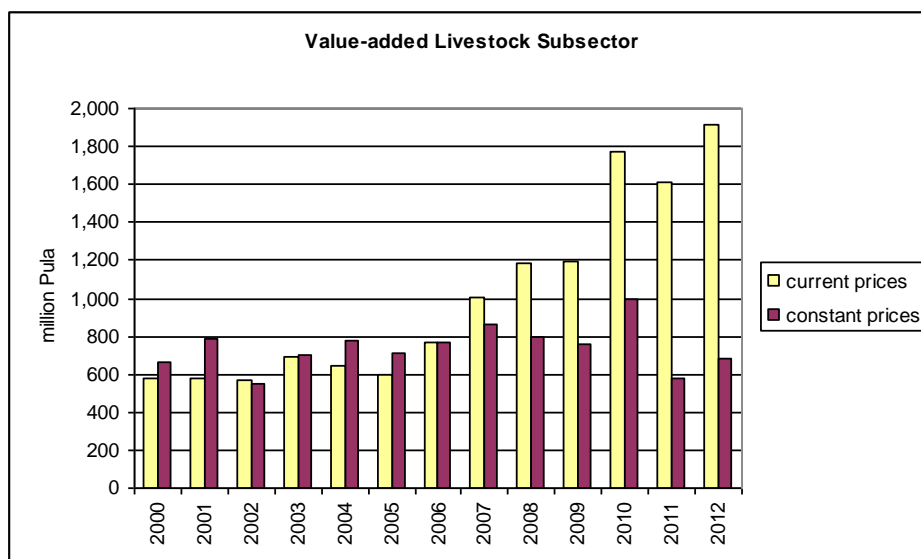
Industrial chicken production has seen significant expansion in recent years. It is not captured in agricultural survey reports, but is included in GDP statistics under "livestock".

Thus, it remains unclear whether incomes derived from the livestock subsector actually increased in 2012 or not.

⁵ We checked whether the sudden growth of the gap between current and constant price series could be explained by exchange rate fluctuations, but had to dismiss the initial hypothesis.

⁶ E-Mail sent on February 25, 2014.

Figure 8: Value-Added of Livestock Subsector, Current and Constant Prices

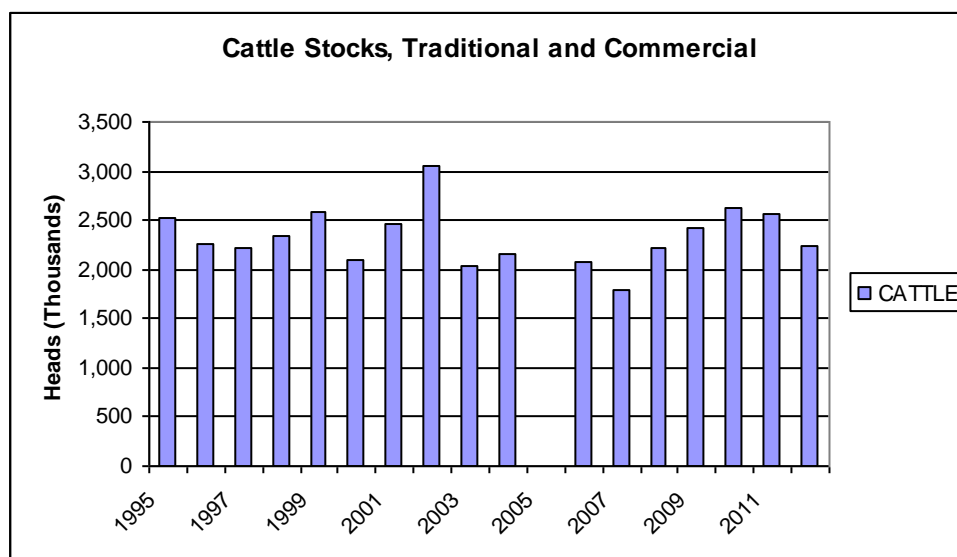


Source of Data: Statistics Botswana: GDP by Sub-industries. File obtained in February 2014.

3.2 Livestock: Agricultural Surveys

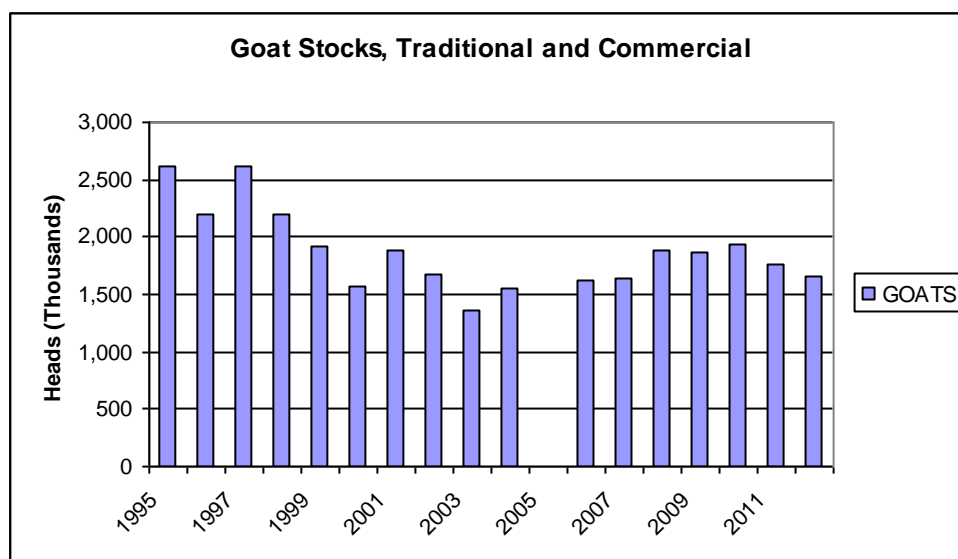
Stocks of cattle and goats, as reported in Agricultural Surveys, have been rather stable over the past 20 years, as shown in the charts below. The succinct drop of cattle population from 2002 to 2003 is emergency sales and death in the wake of a severe drought.

Figure 9: Cattle Stocks



Source of data: Statistics Botswana: 2012 Annual Agricultural Survey Report. Gaborone, April 2014.

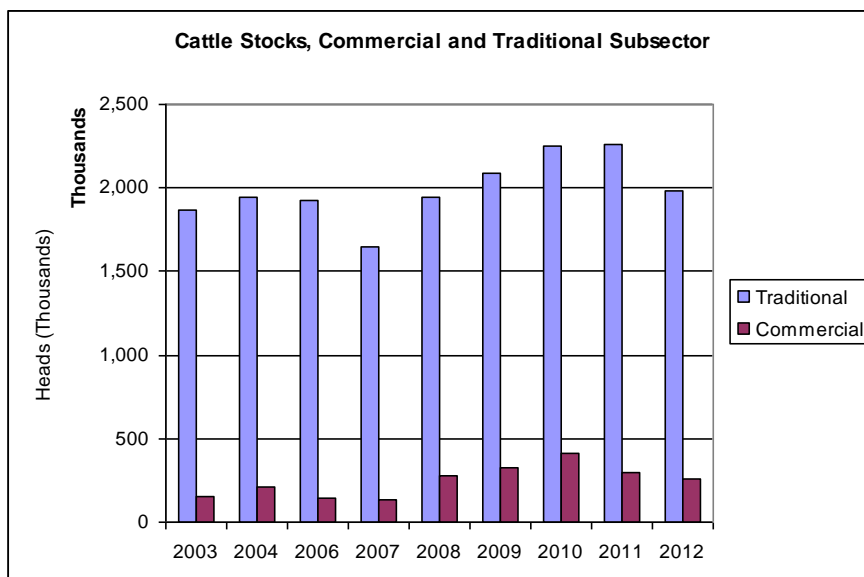
Table 5: Goat Stocks



Source of data: Statistics Botswana: 2012 Annual Agricultural Survey Report. Gaborone, April 2014.

Cattle holding and production is predominantly an activity of the traditional sector. Note, however, that the categories “commercial” and “traditional” depend on the type of land tenure. Although commercial cattle holders are predominantly business oriented, a substantial part of traditional cattle is also owned by individuals who have substantial numbers of heads. In the case of cattle, “traditional” does not mean “small-scale” or “subsistence”.

Figure 10: Cattle Stocks by Commercial / Traditional



Source of data: Statistics Botswana: Agricultural Survey Reports. Various years (assembled from tables in the text part of the report).

Death and off-take rates

Offtake rates, which, in the aggregate statistics, indicate the percentage of animals slaughtered, are always significantly lower in the traditional than in the commercial sector. Low offtake rates can indicate

- high death rates, so that the number available for slaughter is reduced, or
- higher average age – animals grow older before they are taken for slaughter.

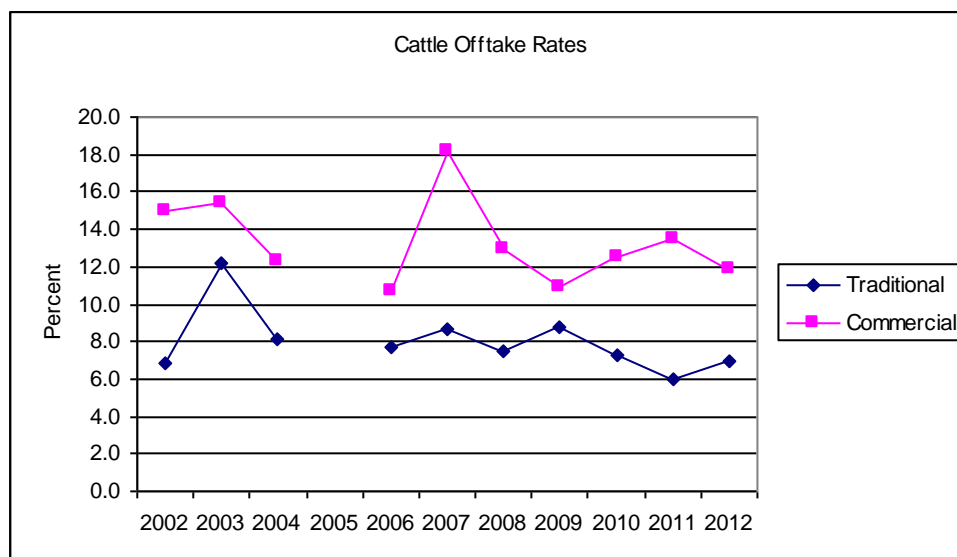
In the case of an impending drought, offtake rates in the commercial sector are exceptionally high as farmers take their cattle for slaughter while they still have a reasonable weight. In the traditional sector, this practice is not widely done, which in part explains higher mortality rates here.

High average age may be indicative of logistical difficulties in selling animals, frequent poor health status and weight so that farmers prefer to wait until food availability has improved and cattle have gained mass, or a conscientious decision by farmers who attach value to herd size itself, for instance because herds are a means of saving and possibly status.

Herd size is limited primarily by the availability of grazing land and access to water. If not related to high death rates, low offtake rates imply that revenue per unit of available land is lower than it could be. Depending on management decisions, this reduces income of cattle holders or contributes to over-grazing.

Offtake rates in the commercial sector are always higher than in the traditional sector, by a substantial margin (Figure 11).

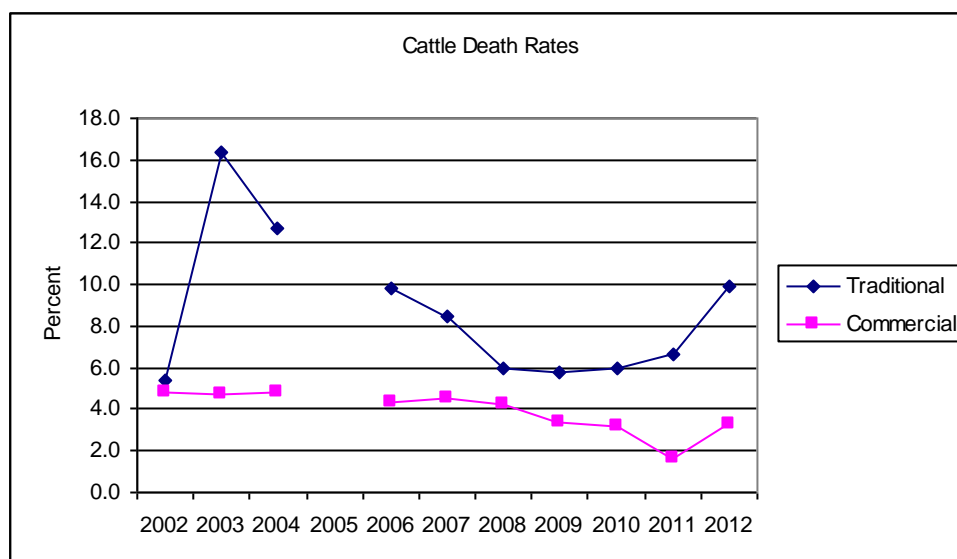
Figure 11: Cattle Offtake Rates, Traditional and Commercial



Source of data: Statistics Botswana: Agricultural Survey Reports. Various years.

While commercial offtake rates are higher than in the traditional sector, death rates are significantly lower (Figure 12). The peak of death rates in the traditional sector in 2003 was due to drought and related lack of feed. Commercial farmers were able to supplement feed and sell off animals that could not be fed in time. These options weren't been available to many holders in the traditional sector.

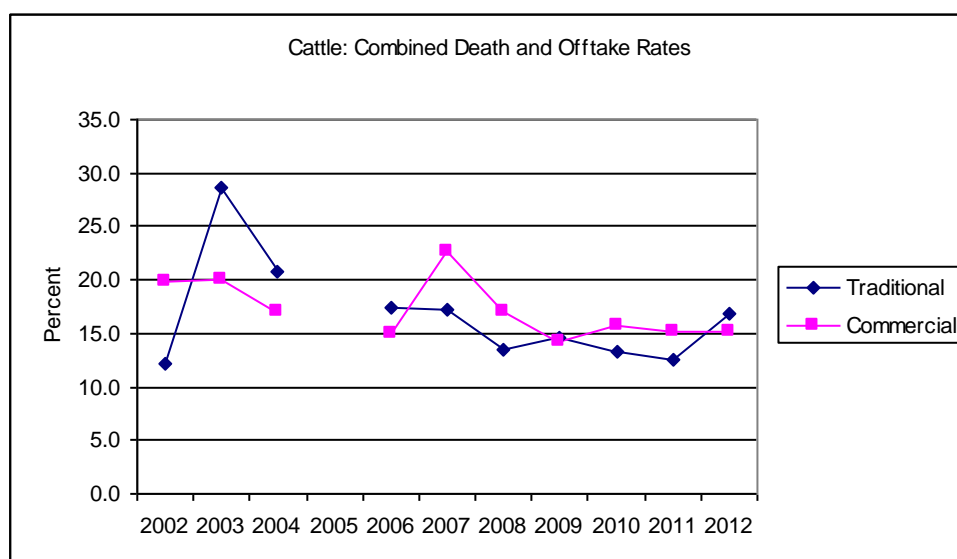
Figure 12: Cattle Death Rates, Traditional and Commercial



Source of data: Statistics Botswana: Agricultural Survey Reports. Various years.

A look at the combined offtake and death rate shows that the remaining differences between the two farming systems tend to disappear, which suggests that low offtake rates in traditional livestock holding are primarily the result of high incidence of deaths Figure 13).

Figure 13: Combined Death and Offtake Rates, Traditional and Commercial



Source of data: Statistics Botswana: Agricultural Survey Reports. Various years.

Statistical tables also show a column denominated as “losses”. These are between 1.5 and 2.5 percent for commercial cattle, but average about 5.5 percent for traditional cattle for the years where data were available. Losses covers stray animals, animals killed by predators and accidents including those suspected to have been stolen. They are higher in traditional cattle oldings because of the inherent difficulties to keep herds together under this extensive grazing system.

A look at statistical data disaggregated by district shows considerable variations across districts, but also consistently high death rates (Table 6). As mentioned, the rate of “losses” is high. The gap between the traditional and the commercial cattle sector are substantial (Table 7).

Table 6: Traditional Cattle Rates by District, Average for Six Years

District	Offtake	Death	Loss	Total	Stock 2011 (Thousands)
Barolong	9.3%	8.5%	3.8%	21.5%	20.3
Ngwaketse South	7.4%	8.1%	3.6%	19.1%	37.2
Ngwaketse North	6.7%	8.5%	2.7%	17.9%	51.1
Ngwaketse Central	6.6%	10.4%	5.0%	22.0%	67.8
Ngwaketse West	6.2%	8.4%	4.3%	18.8%	50.1
SOUTHERN REGION	6.9%	8.8%	4.0%	19.7%	226.5
Bamalete/Tlokweneng	6.3%	14.4%	2.8%	23.5%	18.4
Kweneng South	6.8%	12.3%	4.0%	23.1%	127.2
Kweneng North	6.4%	7.9%	3.4%	17.7%	88.6
Kweneng West	8.3%	7.4%	4.7%	20.4%	119.6
Kgatlang	7.8%	8.6%	6.2%	22.7%	94.6
GABORONE REGION	7.3%	9.3%	4.6%	21.3%	448.3
Mahalapye East	9.5%	9.7%	5.6%	24.8%	53.4
Mahalapye West	8.5%	7.8%	7.1%	23.5%	204.0
Palapye	9.9%	10.1%	6.9%	27.0%	140.9
Serowe	9.5%	6.7%	4.9%	21.0%	159.8
Bobonong	6.3%	12.1%	7.1%	25.6%	52.0
Lethakane	8.7%	8.8%	5.5%	23.0%	191.5
Selebi-Phikwe	7.6%	10.4%	6.2%	24.2%	78.2
CENTRAL REGION	8.7%	8.7%	6.1%	23.6%	879.8
Tati	4.5%	12.5%	4.3%	21.3%	32.5
Tutume	5.6%	10.2%	4.7%	20.5%	224.5
Tonota	8.3%	9.7%	7.5%	25.5%	58.2
FRANCISTOWN REGION	6.2%	10.2%	5.3%	21.7%	315.2
Ngamiland West	2.0%	8.2%	3.3%	13.5%	54.9
Ngamiland East	4.6%	8.9%	6.5%	20.0%	186.2
Chobe	4.5%	12.5%	4.7%	21.7%	2.6
MAUN REGION	3.9%	8.8%	5.7%	18.4%	243.7
Gantsi	11.6%	9.6%	5.4%	26.6%	93.0
Hukuntsi	10.6%	10.1%	13.9%	34.7%	26.7
Tsabong	8.5%	7.7%	6.1%	22.3%	27.0
WESTERN REGION	10.7%	9.0%	7.5%	27.2%	146.7
TOTAL TRADITIONAL	7.7%	8.9%	5.5%	22.0%	2,260.3

Source of data: Statistics Botswana: Agricultural Survey Reports, Table 4.5 and Table 4.5A. Various years.

Note:

Selected years are 2004, 2006, 2007, 2009, 2011 and 2012; the selection was dictated by availability of data.

Table 7: Commercial Cattle Rates, Selected Years

Year	Percent			
	Offtake	Death	Losses	Total
2004	12,3	4,8	2,1	19,2
2006	10,7	4,3	1,5	16,5
2007	18,2	4,5	1,5	24,2
2009	10,9	3,4	1,0	15,3
2011	13,5	1,6	2,4	17,5
2012	11,9	3,3	1,5	16,7

Source of data: Statistics Botswana: Agricultural Survey Reports, Tables 9.x. Various years.

3.3 Poultry

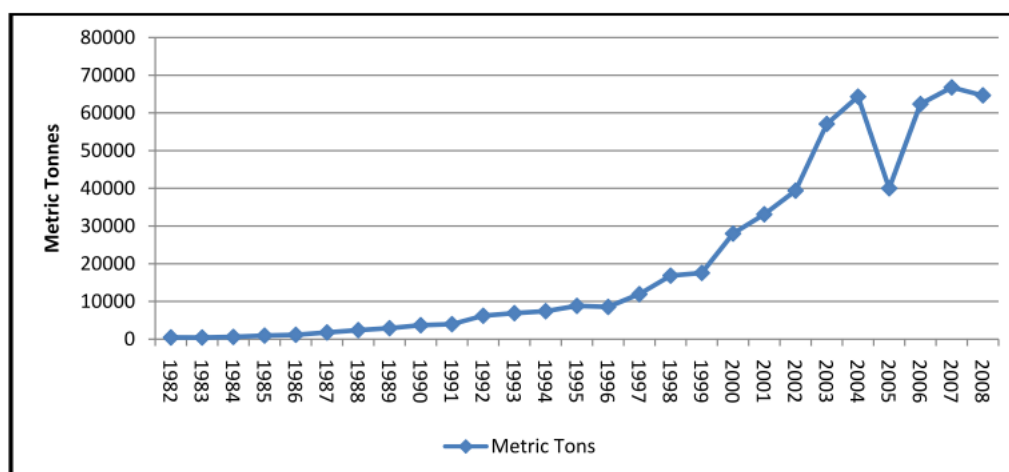
Few data on industrial poultry meat and egg production could be found. This sector is not covered by the Statistics Botswana surveys, but most likely covered in GDP statistics.

Industrial poultry production has increased significantly over the years. Government efforts to create a poultry sector based on smallholders and publicly owned and operated abattoirs have failed, although the installations created in the 1990's became the basis for the industrial sector. Feed is mixed locally on the basis of imported ingredients. All maize required for chicken feed is imported.

The industry is characterized by high concentration (few producers, vertically integrated dominate the market) and important economies of scale. Therefore it is doubtful whether renewed Government efforts to promote once more a diversified poultry industry with high involvement of farmers can succeed.⁷

The only information about poultry meat production that could be found is shown below (Figure 14).

Figure 14: Poultry Meat Production in Botswana



Source: Grynberg, Roman and Masedi Motswapong (2011): Competition and Trade Policy: The Case of Botswana Poultry Industry. BIDPA Working Paper 3. Botswana Institute for Development Policy Analysis (BIDPA), Gaborone. Page 9.

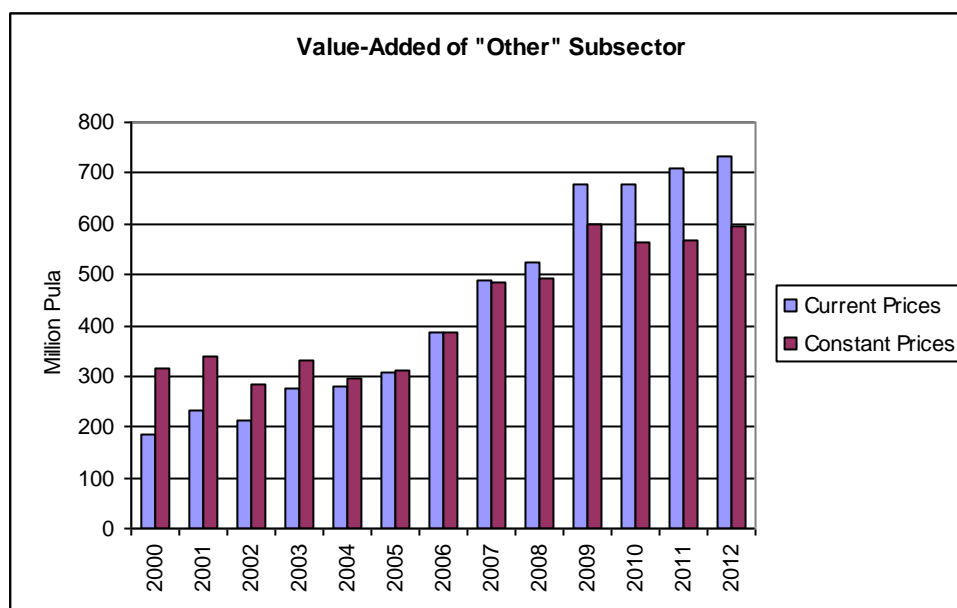
4. Horticulture and others

Horticultural products make up about 70 percent of the “Other” category in detailed GDP statistics. The remainder relates to honey production, fruits, velt products, fishing and forestry.

The series about value-added in the “others” subsector shows substantial and regular growth, and the behavior of the series in constant and current prices, respectively, appears plausible.

According to these series (Figure 8), income derived from horticulture stagnated between 2000 and 2005, then increased significantly until 2009, and stabilized there for the remainder of the period. Nominal value-added continued to grow, as would be expected, as a result of gradually rising prices in Botswana. Without the effects of inflation, real value-added has grown from P388 million in 2006 to about P580 million in the period 2010-12, an increase by approximately 50 percent.

⁷ See Grynberg, Roman and Masedi Motswapong (2011): Competition and Trade Policy: The Case of Botswana Poultry Industry. BIDPA Working Paper 3. Botswana Institute for Development Policy Analysis (BIDPA), Gaborone.

Figure 15: Value-added of the Subsector "Other"

Source of data: Statistics Botswana, GDP by Sub-industries. File obtained in February 2014.

Data are difficult to extract from annual survey reports because it does not present long series on horticultural products. Data until 2009, available from a study published in 2012, are shown below.⁸ The impressive growth is clearly visible.

Table 8: Area and Production of Vegetables Crops in Botswana From 1997-2009

Table 1. Area and production of vegetables crops in Botswana from 1997-2009

Years	Production (Tons)	Area (hectares)	Productivity (yield ha ⁻¹)
1997/1998	6900.00	407.85	16.92
1998/1999	9198.00	496.75	18.52
1999/2000	3546.00	545.45	6.50
2000/2001	7289.00	1060.11	6.88
2001/2002	8080.00	671.35	12.04
2002/2003	13406.00	462.34	29.00
2003/2004	15874.09	904.57	17.55
2004/2005	18179.63	982.36	18.51
2005/2006	30762.95	1036.00	29.69
2006/2007	24076.16	882.45	27.28
2007/2008	31985.00	925.21	34.57
2008/2009	31150.00	830.00	37.53

Source: Madisa (2012)

⁸ See Madisa, M.E.; M. Obopile; Y. Assefa (2012): Analysis of Horticultural Production Trends in Botswana. Journal of Plant Studies, Vol. 1 No. 1, March 2012.

Table 9: Area and Production of Fruit Trees in Botswana From 2003-2009

Table 2. Area and production of fruit trees in Botswana from 2003-2009

Year	Productions (tons)	Area (hectares)	Productivity (yield ha ⁻¹)
2003/2004	3388.05	340.79	9.94
2004/2005	5212.49	311.40	16.74
2005/2006	6686.79	337.97	19.79
2006/2007	8118.99	683.99	11.87
2007/2008	9551.18	1030.00	9.27
2008/2009	7850.00	1030.00	7.62

Source: Madisa (2012)